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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,694	12/16/2003	Shigetaka Hamada	10517/198	3515
23838 7590 07/10/2008 KENYON & KENYON LLP 1500 K STREET N.W. SUITE 700 WASHINGTON, DC 20005				
EXAMINER BERHANU, SAMUEL				
ART UNIT 2838		PAPER NUMBER		
NOTIFICATION DATE 07/10/2008		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

### Office Action Summary

**Application No.**

10/735,694

**Applicant(s)**

HAMADA ET AL.

**Examiner**

SAMUEL BERHANU

**Art Unit**

2838

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03/31/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-11 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-11, 13 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchner et al. (DE 196 49 434 C1) (Hereinafter Buchner) in view of Yi et. al. (US 6,586,123) (Hereinafter Yi), in view of Uozumi (US 6,709,779) , and further in view of Acker (US 6,322,917)

Regarding Claim 1, Buchner discloses, a diagnostic method for a fuel cell comprising a plurality of cells, comprising: supplying an anode of the fuel cell with hydrogen or a hydrogen-containing gas; supplying a cathode with an inert gas or vacuuming the cathode; measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell and the inert gas is supplied to the cathode or the cathode is vacuumed, wherein an operation state of the fuel cell battery is changed when measuring the voltage of a cell; and determining an amount of cross-leak based on the measured gas pressure at the anode, the measured gas pressure at the cathode, and on a measured voltage of each cell. (Page 1, Paragraph 2, Page 2, paragraph 6 and Page 3, Paragraph 1).

Buchner does not disclose measuring gas pressure at the anode; measuring a gas pressure at the cathode.

Yi discloses in Figure 1, elements 40 and 42 ring a gas pressure at the anode; measuring a gas pressure at the cathode. (See also Column 4, lines 34-39, lines 44-48).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use a gas pressure measuring means (instead of calculating the pressure) in Buchner's gas leak determination method as taught by Yi in order to avoid errors that could be introduced using formulas and mathematical equations.

Further, neither Buchner nor Yi discloses explicitly introducing a cooling medium into a battery of the fuel cell; and changing a temperature of the cooling medium when measuring the voltage of each cell.

However, Uozumi discloses in Figures 1-24, a cooling medium (see figure 15 element 10) into a passage with the fuel cell (see column 1, lines 5965, Column 2, lines 15-20).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use cooling medium as taught by Uozumi in Buchner's Fuel cell test system in order to increase the operating efficiency of fuel cell and prevent any fuel cell damage due to heat.

Further, Acker discloses in Column 9, lines 18-22, changing a temperature of the cooling medium when measuring the voltage of each cell (Noted that the Fuel cell voltage measurement can take the temperature of the fuel cell as a variable, therefore this temperature variable can be changed when fuel cell voltage is measured.)

It would have been obvious to a person having ordinary skill in the art at the time of

the invention to monitor a voltage of a fuel cell while temperature change is occurred as taught by Acker in Buchner Fuel cell test system in order to monitor/ determine abnormalities that may occur in the fuel cell.

Regarding Claim 2, Buchner discloses, wherein in the determining step, an amount of hydrogen cross-leak of each cell is determined from the measured voltage of each cell generated based on a principle of a hydrogen concentration cell (Page 2, Paragraph 2).

Regarding Claim 3, Buchner discloses, detecting an amount of the inert gas supplied to the cathode; and calculating an amount of cross-leak based on the pressure of the hydrogen-containing gas at the cathode, on the total pressure of the inert gas supplied to the cathode, and on the amount of the inert gas supplied to the cathode (Page 3, lines 11-30, Page 4, lines 10-29).

Regarding Claim 4, Buchner discloses, wherein the voltage of each cell is measured in a state where the plurality of cells are stacked (Page 1, Paragraph 3)

Regarding Claim 5, Buchner discloses, changing at least one of the gas pressure at the anode and the gas pressure at the cathode when measuring the voltage of each cell (Page 2, Paragraph 2) (noted that the formula in Page 3, line 15 teaches that the voltage of each cell can be calculated with different value of pressure).

Regarding Claim 7, Buchner discloses, wherein the inert gas supplied to the cathode is nitrogen (Page 3, line 3).

Regarding Claim 13, Uozumi discloses in Figures 1-24 , wherein the changing a temperature of the cooling medium changes the temperature of the fuel cell from a first

temperature in the range of normal operation to a second temperature within the range of normal operation.

3. Claims 8-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchner et al. (DE 196 49 434 C1) in view of Muchinc et. al. (US 6,558,824) (hereinafter Muchinc), in view of in view of Yi et. al. (US 6,586,123), in view of Uozumi (US 6,709,779) , and further in view of Acker (US 6,322,917)

Regarding Claim 8, Buchner disclose, a diagnostic method for a fuel cell comprising a plurality of cells, comprising: supplying an anode of the fuel cell with hydrogen or a hydrogen-containing gas; measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell, and determining an amount of cross-leak based on the measured gas pressure at the anode, the measured gas pressure at the cathode and on a measured voltage of each cell (Page 1, Paragraph 2, Page 2, paragraph 6 ,Page 3, Paragraph 1).

Buchner does not disclose explicitly the cathode is vacuumed.

However, Muchinc discloses in the abstract, column 2, lines 1-5, and claims 8 and 19, the cathode is vacuumed.

It would have been obvious to a person having ordinary skill in the art at the time of the invention to add a vacuum injecting means in Buchner's fuel cell stack as taught by Muchine in order to remove the water to ensure proper test results and provide effective fuel cell leak monitoring system.

Neither Buchner nor Muchinc discloses measuring a gas pressure at the anode; measuring a gas pressure at the cathode at the cathode.

Yi discloses in Figure 1, elements 40 and 42, measuring a gas pressure at the anode; measuring a gas pressure at the cathode at the cathode (see also Column 4, lines 34-39, lines 44-48).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use a gas pressure measuring means (instead of calculating the pressure) in Buchner's gas leak determination method as taught by Yi in order to avoid errors that could be introduced using formulas and mathematical equations.<sup>3</sup>

Buchner, Muchinc and Yi do not disclose explicitly introducing a cooling medium into a battery of the fuel cell; and changing a temperature of the cooling medium when measuring the voltage of each cell.

However, Uozumi discloses in Figures 1-24, a cooling medium (see figure 15 element 10) into a passage with the fuel cell (see column 1, lines 5965, Column 2, lines 15-20).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to use cooling medium as taught by Uozumi in Buchner's Fuel cell test system in order to increase the operating efficiency of fuel cell and prevent any fuel cell damage due to heat.

Further, Acker discloses in Column 9, lines 18-22, changing a temperature of the cooling medium when measuring the voltage of each cell (Noted that the Fuel cell voltage measurement can take the temperature of the fuel cell as a variable, therefore this temperature variable can be changed when fuel cell voltage is measured.)

It would have been obvious to a person having ordinary skill in the art at the time of

the invention to monitor a voltage of a fuel cell while temperature change is occurred as taught by Acker in Buchner Fuel cell test system in order to monitor/ determine abnormalities that may occur in the fuel cell.

Regarding Claim 9, Buchner discloses, wherein in the determining step, an amount of hydrogen cross-leak of each cell is determined from the measured voltage of each cell generated based on a principle of a hydrogen concentration cell (Page 2, Paragraph 2)

Regarding Claim 10, Buchner discloses, wherein the voltage of each cell is measured in a state where the plurality of cells are stacked (Page 1, Paragraph 3)

Regarding Claim 11, Buchner discloses, changing at least one of the gas pressure at the anode and the gas pressure at the cathode when measuring the voltage of each cell (Page 2, Paragraph 2) (noted that the formula in Page 3, line 15 teaches that the voltage of each cell can be calculated with different value of pressure).

Regarding Claim 14, Uozumi discloses in Figures 1-24 wherein the changing a temperature of the cooling medium changes the temperature of the fuel cell from a first temperature in the range of normal operation to a second temperature within the range of normal operation.

### ***Response to Arguments***

1. Applicant's arguments filed 03/31/2008 have been fully considered but they are not persuasive.

Applicant argues that there would be no need to regulate the temperature of the fuel cell of Buchner, because it is unlikely that the temperature of the fuel cell in

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Buchner will be as high as it would be in the normal operational. However, that is not quite correct, because there is no statement in Buchner that stated temperature regulation means is unnecessary or it makes the system inoperable. So having temperature regulation means as suggested by the applied references are a way of improving Buchner's gas leak determination method.

2. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, cooling medium will increase the operating efficiency of fuel cell and prevent any fuel cell damage due to heat.

3. In response to applicant's argument that Uozuim and Acker are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, all the references are directed to controlling and monitoring fuel cell system.

4. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

5. It is also noted that all the claimed elements of applicant's inventions were known in the prior art (e.g. temperature regulation, fuel cell leakage determination method, anode and cathode spaces, cooling medium in fuel cell, etc.,) and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention, proper motivation/rationale to combine is as given in the office action. See KSR, 127 S. Ct. at 1740, 82 USPQ2d at 1396.

The rejection based on Saito is withdrawn

***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAMUEL BERHANU whose telephone number is (571)272-8430. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm Ullah can be reached on 571-272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Adolf Berhane/  
Adolf Berhane

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Primary Examiner  
Art Unit 2838

/S. B. /

**Application Number****Application/Control No.**

10/735,694

**Applicant(s)/Patent under  
Reexamination**

HAMADA ET AL.

**Examiner**

SAMUEL BERHANU

**Art Unit**

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